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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/554,896

11/01/2006

Christiane Meyer

19261

9440

272

7590

06/25/2008

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EXAMINER

LE, HOA T

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/554,896	<b>Applicant(s)</b> MEYER ET AL.	
	<b>Examiner</b> H. T. Le	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>Jan. '06 &amp; May '08</u> .                                  | 6) <input type="checkbox"/> Other: ____.                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, it is unclear whether the phrase "its electronic excitation" refers to the intrinsic property of the core (as the term "its" suggests) or is caused to the core by an external application to the surface of the nanoparticles.

In claim 2, "the same anion" has no antecedent basis.

In claim 5, the term "preferably" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

In claim 6, the term "e.g." renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 7 is deemed indefinite in view of its dependency upon claim 5.

Claim 9 suffers the same deficiency of claim 1.

Claim 10 suffers the same deficiency of claim 5.

Claim 12 is confusing because the nanoparticle as described comprises of a core and a shell. However, claim 12 describes a shell as being formed around nanoparticles rather than a core.

Claims 13 and 14 suffer the same deficiency of claim 12.

In claim 18, the term "in particular" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 21 suffers from the same deficiency of claim 18.

Other claims are deemed indefinite in view of their dependency upon claim 1.

### **DETAILED ACTION**

#### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Gray et al (US 5,985,173).

Gray teaches a core-shell nanoparticle comprising a nanocrystalline phosphor (a luminescent material) surrounded by a shell that prevents or reduces non-radiative recombination at the surface of the phosphor. See abstract. The shell consists of oxide or hydroxide (col. 6, lines 44-46).

Claim 2: See col. 6, lines 9-29.

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Claim 3: See claim 1 of Gray.

Claim 4: The fact that only the core contains a luminescent material, yet the core-shell nanoparticle still functions as a luminescent material (i.e. phosphor) necessarily indicates that the thickness of the shell does not exceed the diameter of the core because at a thickness exceeding the core diameter, the nanoparticle would stop functioning as a phosphor.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5-10 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gray et al (US 5,985,173) as applied to claims 1-4 above, and further in view of the discussion below.

Claims 5-10: Gray teaches the claimed core-shell nanoparticle as discussed above. Gray provides a broad teaching of the nature of the materials of the core and the shell without explicitly providing specific materials for the core and the shell. However, such materials of luminescent and non-luminescent as broadly described by Gray are known in the art. For example: (1) Japanese publication 01-318,078 ("JP'078") teaches that core made from a doped luminescent phosphate, in particular  $\text{LaPO}_4$  and shell of non-

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luminescent is known; (2) Japanese publication 11-043,669 (“JP’669”) teaches that luminescent based on metal fluorides activated by Ce, Pr, Gd, Td, Dy, Eu is known; or (3) Japanese publication 05-251,008 (“JP’008”) teaches that luminescent material based on yttrium sulfate activated by Pr is known. Therefore, one of ordinary skill in the art would have found it obvious as a matter of choice to select the core material and the shell material among the conventional materials.<sup>1</sup>

Claims 19-21: Gray teaches the use of the nanoparticle in plasma display (col. 1, lines 10-15); therefore, it would have been obvious to incorporate the nanoparticle in a coating composition or polymer composition or film to form a component for plasma display.

7. Claims 11-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gray et al (US 5,985,173) in view of the German patent DE 101 31 173 (“DE’173”).<sup>2</sup> Gray teaches the claimed core-shell nanoparticle as discussed above but made by a method different than claimed. The DE’173 patent teaches a method of making core-shell particles comprising reacting a mixture of core material and the precursor of the shell material which contains luminescent material at temperature up to 250C. See examples 1 and 2. One of ordinary skill in the art would have found it obvious to apply the process as taught by DE’173 in order to make the material of Gray because the DE’173 states that such process provides a complete and uniform coating (see De’173, paragraph [0005] and [0006]).

8. Other references are cited as art of interest.

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<sup>1</sup> All Japanese documents are cited by Applicant.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. T. Le whose telephone number is 571-272-1511. The examiner can normally be reached on 9:30 a.m. to 6:00 p.m., Mondays to Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. Thi Le/  
H. (Holly) T. Le  
Primary Examiner  
Art Unit 1794

June 22, 2008

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<sup>2</sup> Copy of the DE'173 has been provided by Applicants.